

## CLAIMS

1. A method of mitigating interference in a user uplink signal received at a satellite from a terrestrial user terminal comprising the steps of:

5 generating an estimated interference signal in accordance with one or more parameters;

processing a signal derived from said uplink signal in accordance with said estimated interference signal to reduce the magnitude of corresponding components within said uplink signal; and

10 varying one or more parameters of said estimated interference signal, to determine a respective value of each said parameter to minimise the level of said components in said uplink signal.

2. A method according to claim 1, wherein said parameter comprises  
15 signal amplitude.

3. A method according to claim 1 or claim 2, wherein said parameter comprises delay.

20 4. A method according to any of claims 1 to 3, wherein said parameter comprises Doppler shift.

5. A method of mitigating interference between a first signal and a second signal in a user uplink signal received at a satellite, comprising the steps of:

providing signal estimate data corresponding to at least said first  
5 interference signal;

generating therefrom an estimated first signal;

processing a signal derived from said uplink signal in accordance with  
said estimated first signal to reduce the magnitude of said first signal therein;

providing signal estimate data corresponding to at least said second  
10 interference signal;

generating therefrom an estimated second signal; and

further processing said processed signal in accordance with said  
estimated second signal.

15 6. A method according to claim 5, in which said step of further  
processing comprises deriving at least one parameter of said second signal for  
subsequent use.

7. A method according to claim 6, wherein said step of deriving  
20 comprises demodulating said second signal.

8. A method according to claim 7, further comprising remodulating said second signal and processing a signal derived from said uplink signal in accordance with said remodulated second signal to reduce the magnitude of said second signal therein.

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9. A method according to claim 6, in which said subsequent use comprises processing a signal derived from said uplink signal in accordance with said parameter to reduce the magnitude of said second signal therein.

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10. A method according to any preceding claim, wherein the step of processing comprises subtracting said estimated interference signal.

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11. A satellite communications system comprising at least one satellite (4) in orbit about the Earth, and being for receiving a user uplink signal from a user terminal (2) adjacent the Earth, in the presence of co-channel interference from at least one interference source (121) adjacent the Earth, further comprising means for interference mitigation, characterised in that said interference mitigation means comprises an interference store (250) for storing interference data characterising at least a first signal, and means (270, 232, 234, 236) for iteratively forming an interference estimate from said data in accordance with at least one variable parameter, for locating a value thereof

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to maximise the mitigation of said uplink signal, and for processing said uplink signal in accordance with said value and said interference data.

12. A satellite communications system comprising at least one satellite (4) in orbit about the Earth, and being for receiving a user uplink signal from a user terminal (2) adjacent the Earth, in the presence of co-channel interference from at least one interference source (121) adjacent the Earth, further comprising means for interference mitigation, characterised in that said interference mitigation means is for performing the process of claim 5.

13. The system of claim 11 or claim 12, further comprising an Earth station (6), in which said satellite is a repeater and is arranged to transmit the content of said user uplink signal on a feeder downlink signal to said Earth station (6), and in which said interference mitigation means is on Earth and in communication with said Earth station (6).

14. Interference mitigation means for the system of any of claims 11 to 13.

15. Interference mitigation means for performing the process of any of claims 1 to 10.